

1. A catheter comprising:  
an expandable member having a first end and a second end; and  
an elongate shaft having a first end and a second end, an exterior surface having a recess, a first lumen adapted for fluid communication and a second lumen adapted for fluid communication with the expandable member;  
wherein at least a portion of the first end of the expandable member is attached to the shaft in the recess.
2. The catheter of Claim 1 wherein the shaft has a second recess in which at least a portion of the second end of the expandable member is attached.
3. The catheter of Claim 1 the shaft further comprising an interior surface having a recess, wherein at least a portion of the second end of the expandable member is attached to the recess on the interior surface of the shaft.
4. The catheter of Claim 1 wherein the second end of the shaft further comprises a tip.
5. The catheter of Claim 4 wherein the tip has a recess in which at least a portion of the second end of the expandable member is attached.
6. The catheter of Claim 4 wherein the tip may be part of the shaft or a separate attachment.
7. The catheter of Claim 4 wherein at least a portion of the second end of the expandable member is attached to the tip.
8. The catheter of Claim 1 wherein at least a portion of at least one of the ends of the expandable member forms a cuff.
9. The catheter of Claim 1 further comprising a unitary component having a tip integrally formed with the expandable member, wherein the tip is attached to the second end of the shaft.
10. The catheter of Claim 1 wherein the expandable member is a balloon or a sleeve.
11. A catheter comprising:  
an expandable member having a first end and a second end, each of the ends of the expandable member having a thickness; and  
an elongate shaft having:  
a wall, the wall having an outer surface, and a recess, the wall having at least a first thickness immediately proximal the recess and a second thickness in the recess;  
a first lumen adapted for fluid communication and a second lumen adapted for fluid communication with the expandable member;

wherein at least a portion of the first end of the expandable member is attached to the shaft in the recess such that the thickness of at least a portion of the first end of the expandable member and the second thickness of the wall in the recess is no greater than the first thickness of the wall.

12. The catheter of Claim 11 wherein at least a portion of the first end of the expandable member is attached to the shaft in the recess such that the thickness of at least a portion of the first end of the expandable member and the second thickness of the wall in the recess is less than the first thickness of the wall.

13. A catheter comprising:

an expandable member having a first end and a second end, each of the ends of the expandable member having a thickness; and

an elongate shaft having:

a wall, the wall having an outer surface, and a recess, the shaft having at least a first diameter immediately proximal the recess and a second diameter in the recess;

a first lumen adapted for fluid communication and a second lumen adapted for fluid communication with the expandable member;

wherein at least a portion of the first end of the expandable member is attached to the shaft in the recess such that at least a portion of the thickness of the first end of the expandable member and the second diameter of the shaft in the recess is less than about 1.25 times the first diameter of the shaft.

14. A catheter comprising an elongate shaft having a first and a second end; and an expandable member having a proximal end and a distal end with respect to the first end of the shaft, each of the proximal and distal ends having a thickness, the elongate shaft further having a wall, the wall having an outer surface, and a recess, the shaft having at least a first diameter immediately proximal the recess, a second diameter in the recess, and a first lumen adapted for fluid communication and a second lumen adapted for fluid communication with the expandable member, wherein at least a portion of the proximal end of the expandable member is attached to the shaft in the recess such that at least a portion of the thickness of the proximal end of the expandable member and the second diameter of the shaft in the recess is less than about 1.15 times the first diameter of the shaft.

15. The catheter of Claim 14 wherein at least a portion of the proximal end of the expandable member is attached to the shaft in the recess such that at least a portion of the

thickness of the proximal end of the expandable member and the second diameter of the shaft in the recess is less than about 1.1 times the first diameter of the shaft.

16. The catheter of Claim 14 wherein at least a portion of the proximal end of the expandable member is attached to the shaft in the recess such that at least a portion of the thickness of the proximal end of the expandable member and the second diameter of the shaft in the recess is less than about 1.05 times the first diameter of the shaft.

17. The catheter of Claim 14 wherein at least a portion of the proximal end of the expandable member is attached to the shaft in the recess such that at least a portion of the thickness of the proximal end of the expandable member and the second diameter of the shaft in the recess no greater than about the first diameter of the shaft.

18. The catheter of Claim 14 wherein at least a portion of the proximal end of the expandable member is attached to the shaft in the recess such that at least a portion of the thickness of the proximal end of the expandable member and the second diameter of the shaft in the recess is less than about 0.95 times the first diameter of the shaft.

19. The catheter of Claim 14 wherein at least a portion of the proximal end of the expandable member is attached to the shaft in the recess such that at least a portion of the thickness of the proximal end of the expandable member and the second diameter of the shaft in the recess is less than about 0.9 times the first diameter of the shaft.

20. A balloon catheter comprising:

a head having at least two openings through which fluid may be passed;

a shaft extending from the head, the shaft having a first and second lumen disposed in communication with the at least two openings, the shaft further having an interior, an exterior, an outer diameter and a recess; and

a sleeve having a first end and a second end, each end of the sleeve having a thickness, wherein at least a portion of the first end of the sleeve is attached in a recess along the shaft such that the outer diameter of the shaft at the recess plus at least a portion of the thickness of the first end of the sleeve attached in the recess is less than about 1.15 times the outer diameter of the shaft immediately proximal the recess.

21. The catheter of Claim 20 wherein an expandable cavity is formed between the sleeve and the shaft.

22. The catheter of Claim 20 wherein at least a portion of the first end of the sleeve is attached to the exterior of the shaft, and at least a portion of the second end of the sleeve is attached to the interior of the shaft.

23. The catheter of Claim 20 wherein at least a portion of the first end of the sleeve is attached to the exterior of the shaft, and at least a portion of the second end of the sleeve is attached to the exterior of the shaft.

24. The catheter of Claim 20 wherein the catheter further comprises a tip attached to an end of the catheter shaft.

25. The catheter of Claim 24 wherein at least a portion of the first end of the sleeve is attached to the exterior of the catheter shaft, and wherein at least a portion of the second end of the sleeve is attached to the tip.

26. A catheter comprising:

a head;

an elongate shaft having at least a first lumen extending longitudinally therethrough, a first end, a second end, an interior, an inside diameter and a recess; and

an expandable sleeve having a first end and a second end each end having an edge;

wherein at least a portion of one end of the sleeve is attached to the recess on the interior of the shaft such that the effective inside diameter of the shaft at the edge of the second end of the sleeve is at least about 90% of the inside diameter of the shaft immediately proximal the recess.

27. The balloon catheter of Claim 26 wherein at least a portion of the first end of the sleeve is attached to the shaft so as to form a first cuff, and wherein the second end of the sleeve is attached to the shaft so as to form a second cuff.

28. The balloon catheter of Claim 26 wherein at least a portion of the second end of the sleeve is attached to the second end of the shaft, and wherein the second end of the sleeve defines a portion of the passageway through the shaft.

29. The balloon catheter of Claim 26 further comprising a tip attached to a second end of the shaft.

30. The balloon catheter of Claim 29 wherein the sleeve is attached to the interior of the tip and the exterior of the shaft.

31. A catheter comprising:

a head;

an elongate shaft having at least a first lumen extending longitudinally therethrough, a first end, a second end, an interior, an inside diameter and a recess; and

an expandable sleeve having a first end and a second end each end having an edge;

wherein at least a portion of one end of the sleeve is attached to the recess on the interior of the shaft such that the effective inside diameter of the shaft at the edge of the end of the sleeve is no less than about 0.95 times the inside diameter of the shaft immediately proximal the recess.

32. The catheter of Claim 31 wherein the effective inside diameter of the shaft at the edge of the end of the sleeve is no less than about 0.97 times the inside diameter of the shaft immediately proximal the recess.